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NOTES ON THE MARINE FISHES OF CALIFORNIA

BY

CARL L. HUBBS

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This paper is based in part upon several small collections made by the author during the last two years. In addition, notes are presented of fishes; first, in the Scripps Institution for Biological Research of the University of California, at La Jolla; second, in the collections of Stanford University; third, in the museum of the Los Angeles High School, and fourth, from the Aquarium at Avalon, Santa Catalina Island.

A new genus, *Lestidiops*, and two new species, *L. sphyraenopsis* and *Otophidium scrippsi*, are herein described.

I am indebted to Professor W. E. Ritter for permission to report upon certain fishes in the Scripps Institution, and for kindness shown me during my brief stays at the Institution. I also desire to thank Dr. Charles F. Holder, of Pasadena, and Professor George B. Culver, of the Los Angeles High School, for assistance in obtaining specimens. This paper has been prepared in the Zoology Laboratory of Stanford University, and the kind suggestions of Dr. Charles H. Gilbert, of that institution, have been of material assistance in the preparation of this report.

Raja inornata Jordan and Gilbert

This ray is common off Redondo and Coronado, near shore.

Ophichthus triserialis (Kaup)

This species is common off the west coast of Mexico, and has previously been recorded from the California coast only from Monterey Bay. It is now recorded for the first time from Southern California, the record being based upon two specimens from off San Pedro, and

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upon two from off La Jolla. The northern known limit of the distribution of this species is now extended to Tomales Bay, from which locality Mr. N. B. Scofield has sent a specimen to Stanford University.

The eye of the adult is contained five times in the gape.

Ophichthus zophochir Jordan and Gilbert

Two specimens of this eel, hitherto known from Panama to Guaymas, Mexico, were caught with hook and line off the wharf at Playa del Rey, Los Angeles County. Length 493 and 443 mm. The teeth on the vomer and jaws of the smaller specimen are in two rather irregular rows, while those of the larger specimen are in narrow bands. The origin of the dorsal in this species is subject to some variation, being over the middle or the tips of the pectoral rays. Head 3 in trunk; depth of body 2.5 and 3 in trunk (in larger and smaller specimens, respectively); gape 3 and 2.7 in head; gill openings about one-third wider than eye; eye 1.5 in snout; pectoral 2.4 and 2.6 in head.

Anchovia compressa (Girard)

This anchovy is abundant in the sloughs at Anaheim Landing. Anal rays 39 to 35. There is a wide variation in form, the depth of the body varying from 3.9 to 4.5. The most robust and the most slender specimens are of very different appearance.

Genus **Lestidiops**, new (*Paralepididae*)

Body elongate and compressed, entirely naked, excepting a series of about 120 concealed scales along the lateral line, which rapidly decrease in size posteriorly; a single pore at the end of a long curved tube above and below each scale. Dorsal well behind middle of body, entirely behind ventrals; anal well before dorsal; adipose dorsal short, near caudal; anus midway between ventral and dorsal. Belly with a fleshy keel. Head deep, compressed. Premaxillaries with a pair of anterior canines, followed by a series of short retrorse teeth; mandibular teeth in two series, those of the outer series small, one opposite each inner canine; palatine teeth similar to mandibular teeth; no teeth on the vomer, nor on the broad, free tongue. Gill-rakers short and spinous.

Lestidiops is closely related to the genus *Lestidium*,[1] differing in the absence of teeth on the tongue; in the much more attenuate body posteriorly; and in the character of the lateral line. The pores are

[1] Gilbert, Bull. U. S. Fish Comm. for 1903, part II, p. 608, fig. 236.

single, instead of 3 in number, above and below each concealed scale; these scales are smaller, 120 instead of 68; and the lateral line terminates opposite the middle, rather than the end, of the anal fin.

Genotype, *Lestidiops sphyraenopsis,* new species.

Lestidiops sphyraenopsis, new species

Plate 18

The type-specimen was seined near shore in Avalon Bay, Santa Catalina Island, California, and was procured from the Aquarium. It is deposited in the fish collections of Stanford University (no. 22597).

Body extremely elongate, deepest at the nape, attenuate posteriorly. Snout deep and long; anterior orbital margin behind middle of head; interorbital space flattish, the sides curved gently inward; two low interorbital ridges, slightly convergent posteriorly; premaxillaries forming margin of upper jaw; maxillaries very slender, with an accuminate tip not reaching to below orbit; preorbital groove extended past anterior margin of orbit; premaxillaries with an anterior pair of moderate, curved, depressible canines, about half as long as the mandibular canines; premaxillaries arched and toothless before and between the canines, canine of each side followed by a toothless space, as long as the canine, this space followed by a single series of small retrorse teeth, evenly decreasing in size to the end of the premaxillary; mandible with a double series of teeth, 7 in each series, the inner series composed of depressible canines, one-third as long as orbit; the outer series composed of short fixed teeth, one opposite each canine; vomer and tongue toothless; palatine teeth similar to those of mandible, with 5 depressible canines, and a series of fixed teeth, one opposite each canine, the outer series continued behind the canines, along the trenchant edge of the palatine, extending as far back as the premaxillary. Four long gills; the slit behind the last about as wide as pupil; gill-rakers very short and spinous; pseudobranchiae developed; 7 branchiostegals. Photophores not evident on type specimen.

Pectoral inserted slightly below axis of body; ventrals a little behind middle of body; dorsals inserted well behind ventrals, the interspace longer than the snout; origin of anal but little nearer origin of dorsal than base of caudal; anal base half as long as the distance between anal and ventrals; ventrals short, reaching about half the distance from their base to anus, which is about midway between insertion of anal and origin of dorsal.

Color faded as a result of preservation in strong formaldehyde; no evident markings excepting a dark occipital spot; snout and jaws with traces of dark pigment; vertical fins punctate.

Vertebrae, as counted through the translucent body, without dissection, more than 90; 49, including hypural, behind vertical from origin of dorsal.

This species is apparently not closely related to *Sudis ringens* Jordan and Gilbert,[2] as that species was described as having large scales. *Sudis ringens* also has a shorter head; shorter mandible; shorter snout; the maxillaries reaching to below eye; and a greater distance between dorsal and anal fins, owing to the more posterior position of the dorsal.

Only the type known.

Comparative Table of Measurements in Hundredths of Length to Base of Caudal*

	Sudis ringens	Lestidium nudum	Lestidiops sphyraenopsis
Length to base of caudal, inches	6.25	.....	9
Length to base of caudal, mm.	.....	200	230
Greatest depth of body	6	8.5	6.5
Least depth of body	2	2	2
Depth, between dorsal and anal	.....	6.5	3.6
Length, caudal peduncle	6	.....	5.5
Length, head	16.5	22	20
Length, maxillary	9	10.5	9
Length, mandible	11.5	.....	13
Length, snout	8	11	11
Length, orbit	.....	4	3.5
Width, interorbital	.....	2.7	2
Length, base of dorsal	5.5	3	4.5
Length, base of anal	14	18	13.5
Anus to origin of anal	.....	18.5	21
Tip of snout to ventrals	.....	54	53
dorsal	57	61	65
anal	80	86	80
Length, pectoral	8	(0.4 head)	.....
Fin-rays:			
dorsal	11	9	11
anal	26	33	27
ventral	.....	10	10
pectoral	.....	13	11–12

From figure.

* Measurements based on type-specimen of each species.

[2] Proc. U. S. Nat. Mus., 1880, p. 273 (Santa Barbara Channel).

Lestidium nudum has been recorded by Waite[3] from Sandy Island, South Pacific. His three specimens gave the following counts:

Dorsal rays	12	10	10
Anal rays	29	31	32
Scales	68	68	68

Lestidium japonicum[4] has 42 to 49 anal rays.

Fundulus parvipinnis Girard

Exceedingly abundant in all bays and sloughs; ascending the San Gabriel and San Diego rivers to fresh water. I have also collected this species at Playa del Rey, Anaheim Landing, Mission Bay, San Diego Bay, and in sloughs at the mouth of Tia Juana River, near the Mexican border.

Cololabis saira (Brevoort)

Scombresox saira Brevoort, Perry's Expedition to Japan, 1856, p. 281, pl. VII, fig. 4.

Cololabis saira Jordan and Starks, Proc. U. S. Nat. Mus., 26, p. 537, 1903.

Scombresox brevirostris Peters, Monatsberichte Akad. Wiss. Berlin, July, 1866, p. 521.

Cololabis brevirostris Jordan and Evermann, Fishes of North and Middle America, I, p. 726, 1896.

I am unable to separate our specimens of *Cololabis* from California (called *C. brevirostris*) from specimens of the Japanese species, *C. saira*.

TABLE OF MEASUREMENTS IN HUNDREDTHS OF TOTAL LENGTH TO CAUDAL BASE

	Monterey Bay				Japan			
Length, mm.	173	185	178	177	290	161	155	141
Length, head	21.4	21.4	21.2	21.2	20	21.4	21.4	22
Length, eye	4	4	3.8	3.9	3.2	3.9	3.9	4.2
Width, bony interorbital	3.7	3.7	3.8	3.9	3.6	3.9	3.6	4
Length, snout	8.5	.....	8.5	8.3	8	8.3	8.2	9
Length, maxillary	5.5	.....	6	5.5	5	6	6	6
Length, mandible	11	.....	11	11.5	10.5	11	11.5	11.5
Length to anus	68	70	68	69	68	67.5	68	68.5
Depth, body	.....	12	12	11.5	10.5	11	11.5	11.5
Width, body	.....	6	5.5	5	5.5	5.5	5	5
Depth, caudal peduncle	.....	2.5	2.3	2.5	2.5	2.5	2.5	2.6
Snout to dorsal	72	72.5	71	72	72	73	71	72
Length, dorsal base	9.5	9	8.5	8	9.5	9	8.6	9

[3] Trans. N. Zealand Inst., Vol. XLII, 1909 (1910).

[4] Tanaka, Annotationes Zoologicae Japonensis, Vol. VII, pt. 1, 1908.

Table of Measurements in Hundredths of Total Length to Caudal Base—(*Continued*)

	Monterey Bay				Japan			
Height, dorsal fin	.....	5.5	6	6	5.5	5.5	6	6
Height, first dorsal finlet	.....	3.5	4	3.5	3.2	3.5	.....	3.5
Length, anal base	10	10	10	9	10.3	11	10	11
Height, first anal finlet	.....	3.2	3.5	.....	3.2	3.5	3.2	3.5
Length, pectoral	.....	7	7	7	7	7	7	8
Ventral to anus	14	13	13.5	13	13	11.5	12	13
Length, ventral	6.5	6	6	6	6.2	6.5	6.5	6

Table of Scale, Fin, and Gill-Raker Counts

	Monterey Bay			Japan	
Scale rows	121	117	119	121	115
Dorsal rays	9	10	10	10	11
Dorsal finlets	6	5	6	6	6
Anal finlets	6	6	6	7	6
Pectoral rays	13	13	13	13	14
Gill-rakers; first arch	9 + 38	.....	.....	8 + 37	.....

Syngnathus californiensis Storer

A male specimen, 224 mm. long, was collected on August 8, 1913, among a large quantity of kelp on the beach at Coronado. Head 9; D. 43; rings 19 + 48; dorsal on 1 + 9 rings; pouch (containing eggs) on 23 caudal rings; eye 8.2; snout 2; body 2.4 in tail; depth 3.5 in head; pectoral 6 in head; caudal 4.2; height of dorsal 5.5 in its length; base of dorsal ¼ longer than head. Color olive-green anteriorly, shading into brown on tail; pouch unmarked; sides anteriorly with gray rosettes between rings. Head sparingly spotted with gray.

A specimen in the Scripps Institution was taken at a surface haul off La Jolla. D. 43; rings 21 + 47; dorsal on 1 + 9 rings; snout 1.8; eye 8.

Both of these specimens were taken from the kelp beds, while none were found in the bays, where the following species is abundant.

Syngnathus leptorhynchus Girard

This is the commonest pipe-fish in the bays and sloughs. Specimens were obtained in the sloughs at Anaheim Landing, Orange County, and in San Diego Bay.

The specimens from Anaheim Landing show some variations from current descriptions. The adult length is greater, 10 instead of 6

inches. The pouch extends over 20½ to 22 caudal rings, instead of 19. The dorsal fin rays are more numerous, 31 to 35 instead of 30 to 32; and the fin covers from 1 + 7 to 0 + 8 rings. The caudal rings are more numerous, 39 to 43, instead of 36 to 41.

Males taken in January at Anaheim Landing contained eggs in the pouch; those taken in April contained young; a female, 165 mm. long, collected on August 6, contained large eggs; a male, 127 mm. long, taken on the same day, had the pouch empty.

In young specimens 4 types of coloration were found. Some were entirely green, corresponding to the color of the eel-grass in which the fish were taken; others were entirely grayish-brown, corresponding closely to the color of some growth on the algae; others were green, with a grayish-brown stripe along the dorsal surface; still others were green, with horizontal bars of grayish-brown. It may be of interest to note that these four types of coloration were also found in prawns taken with the pipe-fish.

Syngnathus griseolineatus Ayres

A female specimen, from Santa Cruz, 210 mm. long (without caudal). D. 40, on 1 + 8 rings; rings 19 + 43; eye 8.2; snout 1.7. Another specimen, a female 215 mm. long, was collected by Mr. N. B. Scofield in San Francisco Bay. D. 41, on 1 + 8 rings; rings 18 + 42; eye 8.7; snout 1.6.

Syngnathus barbarae (Swain)

Dr. C. H. Gilbert has re-examined the type of this species, and permits the writer to present the following from his notes:

Dorsal, 35.

Species certainly distinct from *griseolineatus* or *leptorhynchus*, with which the type has been directly compared.

It is probable that the tail is abnormally shortened in this specimen. The caudal is irregularly attached, the joint being abnormal and not as small as usual, the caudal peduncle not normally tapering. The presence of but 10 rings behind the caudal pouch also suggests an early accident and the formation of a new caudal fin. The dorsal completely covers 8 rings, the first of which contains the anus.

Measurements in Hundredths of Total Length to Vent; 1, the Type of *S. barbarae;* 2, *S. griseolineatus;* 3 and 4, *S. leptorhynchus*

	1	2	3	4
Length in mm.	91	99	70	53
Head	30.5	31.1	28	29
Snout	14.9	17.1	13	13
Greatest depth snout	5.1	4	5	4.5
Least depth snout	3	2.6	2.8	2.8
Eye	2.8	3.5	3	4
Greatest depth trunk	9	7.7	7.5	6
Base of dorsal	29	30	27	26
Length of brood pouch	89	.....	.....	.....

Syngnathus auliscus (Swain)

Collected with *S. leptorhyncus* at Anaheim Landing. The color is plain brown, sometimes with lighter rings. The specimens show the same differences from current descriptions that were noted by Starks and Morris.[5] Two specimens collected in San Diego Bay on February 14, 1914, are 100 mm. long, one a male with eggs in the pouch, the other a female with mature ova.

Syngnathus arctus (Jenkins and Evermann)

Two specimens were taken with *S. leptorhyncus* in the eel-grass of Spanish Bight, San Diego Bay, by Mrs. Frank Stephens.

Leuresthes tenuis (Ayres)

Specimens were bought from a fisherman, who had seined them between Newport and Laguna. Dorsal IV or V–I, 8 to 11.

Several specimens of this species were sent to Stanford University by Mr. J. B. Joplin, of Santa Ana, who described the breeding habits of this fish. He wrote:

"It is the peculiar nature of these fish which attracts our attention. Three months during the year, usually March, April and May, on the second, third and fourth nights after the full moon, at full tide, great schools of them come out in the breakers, at the mouth and for half a mile on each side of where a small fresh water stream flows into the ocean, for the purpose of depositing its eggs or spawn in the sand. The water recedes and when the fish are not disturbed they wiggle tails down in the sand, as far out as the force of the water will carry them, both males and females together—sometimes as many

[5] Univ. Calif. Publ. Zool., Vol. 3, p. 185, 1907.

as eight or ten together—where the crust of the sand has been broken. Sometimes only one female is found, with just her head visible.

"Why they come out at night, which is usually from 10 to 1 o'clock, and the run usually lasts three hours or longer, is one question.

"I have been observing them for thirty years and the time of their coming is so regular that during that time I have rarely missed them."

A detailed study of these interesting habits, or a confirmation of them, is highly desirable.

Icosteus aenigmaticus Lockington

A specimen in the Scripps Institution, from the Cortez Banks, off San Diego, was collected in June, 1913, at a depth of 80 to 90 fathoms. This species has heretofore not been recorded south of Monterey Bay.

Lepidopus xantusi Goode and Bean

Two more specimens of this species have been taken in southern California. One, from off La Jolla, has 79 dorsal spines; the other, from Avalon, has 80.

Paralabrax maculatofasciatus (Steindachner)

This bass is common along the Southern California coast northward to Redondo.

Sebastodes goodei Eigenmann and Eigenmann

A specimen in the Scripps Institution has the anal rays III, 9.

Sebastodes aurora (Gilbert)

A small specimen in the Scripps Institution was dredged in 150 to 185 meters, off La Jolla. Dorsal, XIII, 13; anal, III, 6; pores, 29; eye, 3.1; maxillary, 2.1; 19 gill-rakers on the lower limb of the outer arch, the anterior ones small, the longest gill-raker 2.2 in eye.

Sebastodes diploproa (Gilbert)

A specimen, 125 mm. long without caudal, in the Scripps Institution, was dredged off La Jolla, at a depth of 292 meters. Dorsal, XIII, 13; anal, III, 7; 37 pores in lateral line; scales deciduous, much more numerous than the pores; premaxillaries anteriorly forming the two projecting, dentigerous lobes diagnostic of the species; preorbital with two strong spines; gill-rakers 11 +24, those at both ends of the arch small, the longest 3.5 in postorbital length of head; orbit, 2.8; interorbital width, 2.25 in orbit. The eye is larger, and the interorbital narrower, than usual in this species.

A small specimen, 67 mm. long, was dredged off La Jolla, at a depth of 185 meters. Dorsal, XIII, 13; anal, III, 7; head, 2.5; depth, 2.9. Another small specimen, 41 mm. long, was obtained off La Jolla, at a depth of 160 fathoms. Dorsal, XIII, 12; anal, III, 7; head, 2.33; depth, 3. A dark spot present on anterior soft rays of dorsal and anal fins.

Table of Measurements of Paratypes of *S. diploproa.*

Orbit in head	Interorbital in orbit	Orbit	Interorbital
3	1.9	3.2	1.8
3.1	1.8	3	1.85
3.1	1.95	3	2
3	1.95	3	1.8
3.05	2	2.9	2
3.33	1.7	2.8	1.85
3.2	1.75	2.8	2
3	1.75	3	1.8
3	2	3.2	1.9
3.1	2	....	.....

Sebastodes saxicola (Gilbert)

Plate 19

Three specimens in the Scripps Institution were dredged off La Jolla, at a depth of 185 meters. They differ somewhat from the type description, but the differences are apparently due to individual variation. Body deeper; depth, 2.66 to 2.75; caudal peduncle also deeper. Two specimens have 8 soft anal rays. Pores, 35 to 37 in the lateral line, 45 in type description, 36 and 41 in two specimens from Albatross Station 3677. Anal spines shorter, the second 3 in head. About 24 gill-rakers on lower limb of outer arch.

MEASUREMENTS IN HUNDREDTHS OF LENGTH TO BASE OF CAUDAL

	Off La Jolla			Alb. Sta. 3677	
Length, mm.	103	94	90	99	95
Length, head	40	42	39.5	38	39
Length, orbit	14.5	15	13.5	14	13.7
Length, snout	9	9	8	9	10
Length, maxillary	18	19	19	17	17
Width, interorbital	8	7.5	7	7	7
Depth, body	37	40.5	37	33.3	32.7
Depth, caudal peduncle	10	10.5	10	9	9
Width, body	18	20	17.7	16	16
Height, dorsal spines	14.5	16	16.5	16	15.5
Height, soft dorsal rays	15	16	15.5	14	13.5
Height, first anal spine	7	7.5	7.5	10	8
Height, second anal spine	.....	15	17	20.5	18
Height, third anal spine	12	13	13	17	15
Height, soft anal rays	14	16	15	19.5	18.5
Length, pectoral	28	30.5	29.5	30	28.5
Length, ventral spine	15.5	16	16.5	15.5	15
Length, ventral rays	21	22	21.5	21	20.5
Dorsal soft rays	12	12	12	12	13
Anal rays III,	8	7	8	7	7
Pectoral rays	16	16	16	16	16
Pores in lateral line	35	36	37	36	41

Sebastodes elongatus (Ayres)

A specimen with 14 dorsal spines was collected in the San Diego market.

Scorpaena guttata Girard

Very common in Santa Monica, San Pedro, and San Diego Bays. Forty-five to 55 pores in the lateral line. Spines of head variously developed; the opercular spines straight and weak in some specimens, curved and strong in others.

Zonogobius zebra (Gilbert)

Twenty-four specimens in the Scripps Institution, from San Clemente Island, show some differences from the type description, probably due to the fact that the type was only 12 mm. long. Some of these discrepancies were corrected by Snodgrass and Heller[6], who reported on a specimen taken by R. C. McGregor at Todos Santos Island, Mexico. This specimen agrees in all respects with those from

[6] Proc. Wash. Acad. Sci., Vol. VI, p. 416, 1905.

San Clemente Island. The measurement of the spinous dorsal in the table of Snodgrass and Heller is of the second ray, the first and longest ray being broken; the pectoral fin is also broken, the fin being much longer than indicated.

Scales with a row of apical spines; no scales on head, belly, nor along base of spinous dorsal. Cross bars half as wide as interspaces in the largest specimens, but relatively much wider in those as small as the type; the bars in alcoholic specimens are olive brown, with darker streaks along each border and near the center. Last soft ray of dorsal and anal longest. In the adult, but not in the young, the first dorsal spine is filamentous. Teeth in a wide mandibular band; and in a narrow maxillary band, the outer series of which is enlarged. The teeth of the lower jaw are not in 2 series, as stated by Snodgrass and Heller.

Measurements of Five Specimens

Length to base of caudal, mm.	39	38	33	27.5	19
Length of head	3.8	3.8	3.8	3.9	3.5
Depth, body	4.4	4.9	4.7	4.4	4
Length, eye	4.25	4.1	4	4.2	3.3
Length, maxillary	2.3	2.4	2.2	2.3	2.4
Cross bars behind eye	16	16	16	16	15
First D. spine in length of body	2	.....	2.6	.....	8.2
Second D. spine in length of body	2.8	3.6	4	.....	8.2
Third D. spine in head	1.6	1.65	1.6	1.7	2.2
Soft rays of dorsal	1.6	1.55	1.6	1.55	1.7
Length, caudal	1.2	1.2	1.2	1.25	.....
Height, anal	1.8	1.5	1.4	1.5	1.6
Length, ventral	1.33	1	1.2	.....	1
Length, pectoral	.95	1	.8	.8	1
Dorsal rays VI,	13	13	13	13	13
Anal rays	10	10	10	10	9

Gillichthys mirabilis Cooper

This curious mud-burrowing goby was found abundantly in bays and sloughs at Ventura, Playa del Rey, San Pedro, Anaheim Bay, Mission Bay, and in sloughs at the mouth of Tia Juana River, near the Mexican border.

Clevelandia ios (Jordan and Gilbert)

This little goby, together with the related species, *Quietula y-cauda* and *Ilypnus gilberti*, is common about the sloughs, especially in the small pools left on the mud flats by the retreating tide. They have

similar burrowing habits to those of the larger *Gillichthys,* but frequently merely bury themselves with mud or sand by a lateral movement of the body and fins. *C. ios* ascends the San Gabriel River to fresh water. A specimen in the Stanford University Museum was collected in San Bartolome Bay, Lower California.

Typhlogobius californiensis Steindachner

Two specimens of the Blind Goby, hitherto known from Point Loma, Laguna Beach, and from Dead Man's Island and Point Fermin, near San Pedro, were collected in the rock pools of Rocky Point, near Redondo. Another specimen, in the Scripps Institution, was collected in the rock-pools near La Jolla.

Echineis remora Linnaeus

Two specimens, from Santa Catalina Island, have 16 or 17 laminae.

Neoclinus satiricus Girard

Fairly common at Redondo and at Avalon, Santa Catalina Island.

The membrane connecting the maxillaries with the lower jaw is green in life, abruptly edged with yellow.

Hypsoblennius gentilis (Girard)

Two blennies of this species, from San Diego Bay, show some variations from current descriptions. Head, 3.7 and 4, respectively; dorsal, XIII, 15 and XIII, 16; maxillaries extending in one specimen to below middle of eye, in the other to below posterior margin of eye; length of maxillary, 2.6 and 2.3; lateral line developed in one specimen beyond the anterior straight part, its tip being pointed downward.

Cryptotrema corallinum Gilbert

One specimen, in the Scripps Institution, was dredged off La Jolla. Length, 44 mm., without caudal; head, 3.8; depth, 6; dorsal, XXVII, 12; anal, II, 26; interorbital, 2.1 in orbit; 45 scales along straight part of lateral line, 6 on oblique portion, 19 on posterior straight part, 70 in all.

Anarrhichthys ocellatus (Ayres)

One specimen, in the Museum of the Los Angeles High School, was caught by fishermen off Redondo. This is the first record south of Santa Barbara.[7] Length, about 1255 mm.; head, 9.2; depth, 1.3;

[7] Jordan and Gilbert, Proc. U. S. Nat. Mus., vol. 5, p. 412, 1882.

longest dorsal ray, 1.3; pectoral, 1.55; eye, 8.9 in head; snout, 4.75; maxillary, 2.25; interorbital, 6.2; width of head, 2.2

Maynea californica Gilbert[8]

Five specimens in the Scripps Institution, from off La Jolla.

Table of Measurements in Hundredths of Length to Base of Caudal

Length, mm.	69	112.5	115	123	131
Length, head	15	14	14	14.5	14
Length, eye	2.7	2.2	2.3	2.3	2.2
Length, snout	3.2	3.3	3.3	3.3	3.3
Length, maxillary	5	4.3	4.5	5	4.3
Depth, body	8.5	8.1	10	9	8.5
Length, pectoral	7	6	7	6.2	6.7
Snout to dorsal	.....	18.5	19	18	18.9
Snout to anal	.....	35	36	36.5	37

Otophidium taylori Girard

Otophidium taylori Girard, Pac. R. R. Surv., X, Fishes, 1858, p. 138.
Chilara taylori Jordan and Evermann, Fishes of North and Middle America, III, 1898, p. 2489.

Professor J. O. Snyder has called my attention to the fact that the so-called foramen of the air-bladder, the absence of which has been supposed to separate *Chilara* from *Otophidium*, is sometimes present in this species, its form and size subject to great variation. The genus *Chilara* is apparently untenable.

Two small unspotted specimens, in the Scripps Institution, were collected off La Jolla, at a depth of 55 meters. Head 5.9 and 6 in length without caudal; depth, 10 and 11.2; gill-rakers, x + 7 to 9. One large spotted, and two small unspotted specimens, from Santa Catalina Island, have 8 gill-rakers on the lower limb of the outer arch.

Otophidium scrippsi, new species

Plate 20

Chilara taylori Starks and Mann, Univ. Calif. Publ. Zool., Vol. 8, 1911, p. 16 (based on type of *O. scrippsi*); ? Snodgrass and Heller, Proc. Wash. Acad. Sci., Vol. VI, 1905, p. 420 (not *O. taylori* Girard).

The type, deposited in the Scripps Institution, La Jolla, California, is a specimen 168 mm. long without caudal. It was dredged on September 1, 1908, near Cerros Island, off the coast of Lower California; lat. 28° 2′ 1″ N.; long. 115° 6′ 0″ E.; depth, 73 meters; bottom, green

[8] Proc. U. S. Nat. Mus., 48, 1915, p. 362, pl. 19, fig. 17.

mud. *O. scrippsi* is not closely related to *O. taylori,* having fewer gill-rakers, a longer head, a more robust form, and plain coloration. It is more closely related to *O. galeoides* (Gilbert) and to *O. indefatigabile* Jordan and Bollman, but differs from them in the longer head, smaller eye, plain coloration, and the long, slender gill-rakers. There are 5 instead of 4 gill-rakers on the lower limb of the first arch, and the longest is more than one-third as long as eye; while the short, broad gill-rakers of the related species are contained about 5.33 in the eye.

Form of body as in related species, the depth 5.7 in length without caudal; greatest depth at origin of dorsal; body moderately compressed anteriorly, rather sharply compressed posteriorly.

Upper profile of head convex, not greatly curved from eye to occiput; snout moderately blunt, 4.75 in head to upper angle of gill opening; head, 4.5 in length without caudal; eye nearly round, 4.2 in head; interorbital spece flattish, widening rather abruptly posteriorly, its least width 1.5 in eye; lower jaw included; maxillary, 2.75 in head; preorbital width, 2.6 in eye. Teeth rather small, in narrow bands on jaws and palatines, and in a triangular patch on vomer; the outer premaxillary series a little enlarged. Nostrils without conspicuous flaps, the two nearly evenly spaced between margin of eye and tip of snout; opercle ending in a sharp, flat, concealed spine; gill-rakers rather slender, the longest, at angle, nearly as long as pupil, almost one-third as long as eye; 3 tubercles on upper limb of gill arch, 5 well developed gill-rakers on lower limb; pseudobranchiæ small, but evident, the filaments about half as long as pupil; 6 branchiostegals.

Scales small, somewhat imbedded, non-imbricate, widely spaced on belly, their longer axes frequently at right angles. Head and fins naked. Lateral line high, its distance from dorsal base .2 its distance above anus.

Fins as in other species, except that the caudal is emarginate. Pectoral, 2.3 in head; ventral, 2.2.

Air bladder short and thick in type, especially hardened and thickened in a very definite median horizontal band, this band divided posteriorly by a deep constriction, not quite as deep as diameter of pupil; distance from end of air-bladder to anus, 2.4 in head; no posterior foramen.

Back light dusky; sides lighter; belly and under side of head pale. Body without dark spots or other markings. Dorsal light, margined with blackish; anal similar to dorsal, the margin widening posteriorly; paired fins pale.

A small specimen was taken by Snodgrass and Heller in the Galapagos Archipelago, "from the stomach of a tunny at Tagus Cove, Albermarle Island," and referred by them to *C. taylori.* It has 5 gill-rakers on one side and 4, with 2 rudiments, on the other side and certainly is not *O. taylori.* The gill-rakers are longer than in *O. indefatigabile* or *O. galeoides,* resembling those of *O. scrippsi,* of which species it may be the young, although the teeth are relatively larger. (Named for Miss Ellen B. Scripps, whose generous gifts to the Scripps Institution have been a great help in the study of the zoology of Southern California).

Hippoglossina stomata Eigenmann and Eigenmann.

One specimen was purchased in the San Diego market. Eyes sinistral. Vertebrae 11 + 27, with hypural; the anterior 5 vertebrae much smaller than those following, the length of the second only half that of the eleventh; these anterior 5 vertebrae directed slightly downward.

Lyopsetta exilis (Jordan and Gilbert)

Three young specimens, 73, 76 and 96 mm. long, without caudal, in the Scripps Institution, were taken at a depth of 292 meters off La Jolla.

Pleuronichthys verticalis Jordan and Gilbert

This species is common in the San Diego market. A specimen 190 mm. long, without caudal, was collected in the San Francisco markets by Dr. D. S. Jordan. It is dark brown on the eyed side; a black spot, not ocellated, on lateral line near middle of its length; indistinct darker spots on each side of caudal peduncle, and elsewhere on body, corresponding to certain of those on the other specimen obtained; vertical fins with darker bars, and with a very narrow white border, widest anteriorly; dorsal fin light anteriorly; extreme tips of rays of paired fins white. Another specimen, 210 mm. long, was collected with the specimen just described. Its coloration is highly variegated: the large median spot is strikingly ocellated by a white ring, and smaller white spots are scattered over the body, surrounded by dark rings, which form reticulations about the white spots anteriorly. Other specimens vary from this ornate type of coloration to a perfectly plain type.

Pleuronichthys ritteri Starks and Morris[9]

One specimen from off San Pedro.

Young specimens have a variegated coloration. A specimen 61 mm. long, without caudal, from off La Jolla, has the 3 ocellated spots very distinct; in addition there are 2 others posteriorly along the bases of the dorsal and anal. Body mottled with dark and light brown; a conspicuous square dark blotch, wider than eye, between median ocellated spot and caudal, others, less distinct, before and behind it; body covered with mottled areas which are frequently bordered with narrow dark lines. Dorsal and anal variegated, darker anteriorly, with a small dark spot opposite the anterior ocellated spot along the base of the fin. Caudal dark, with about 5 vertical bars, and with a whitish edge. Pectoral with 3 broad bars. Ventral light brown. All fins colorless on the blind side, except the decurrent part of the dorsal.

Pleuronichthys coenosus Girard

One specimen, in the Scripps Institution, was taken off La Jolla on July 10, 1914. Several like specimens, with highly variegated coloration, were seen in the aquarium at Avalon, Santa Catalina Island.

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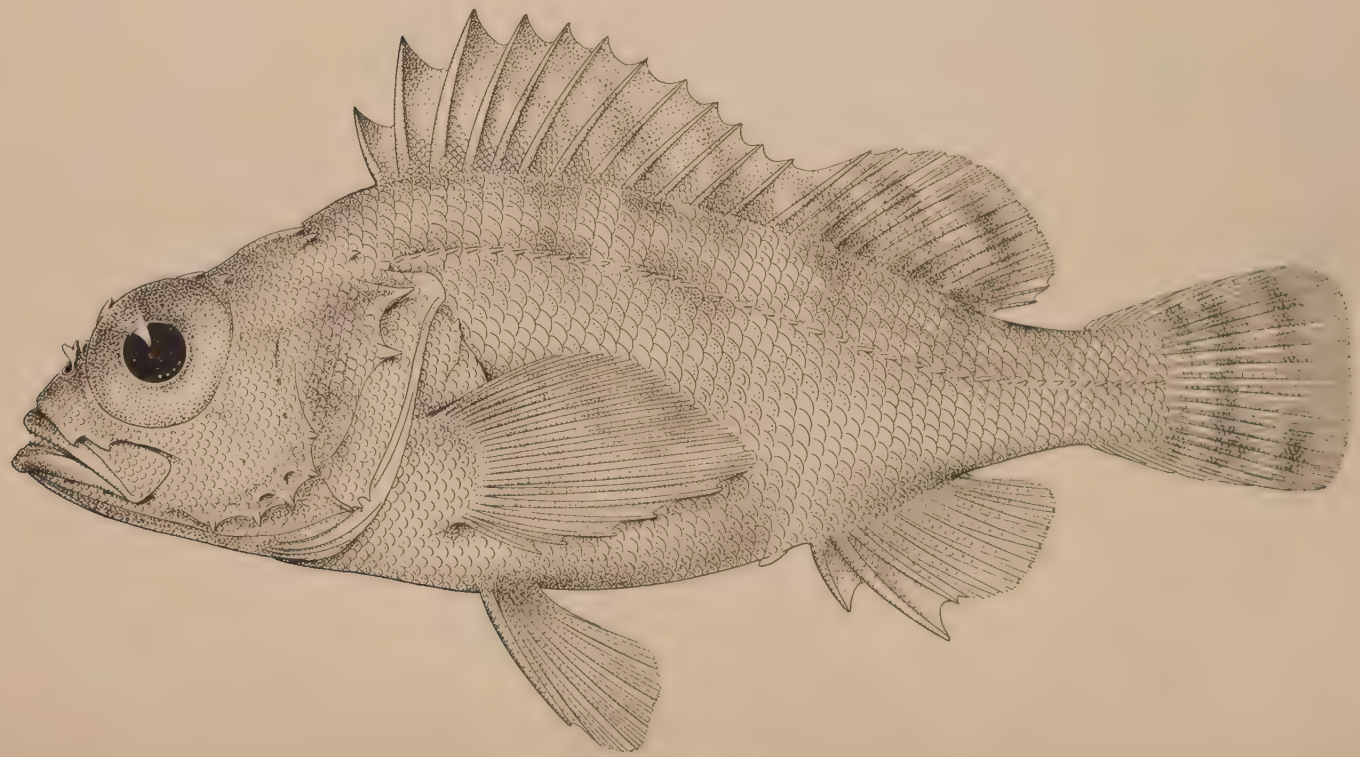
[9] Univ. Calif. Publ. Zool., Vol. 3, p. 243, pl. XXI, 1907.

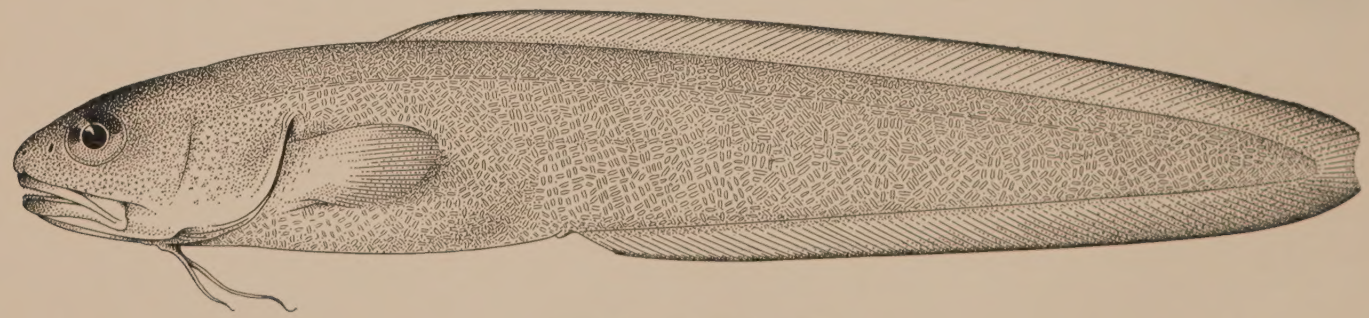
Transmitted September 2, 1915.

Lestidiops sphyraenopsis (× .77).
Drawn by W. S. Atkinson from the type-specimen from Avalon.



Sebastodes saxicola (Gilbert).

Drawn by W. S. Atkinson from a specimen taken in 185 meters off La Jolla.



Otophidium scrippsi (× 1.1).
Drawn by W. S. Atkinson from the type-specimen from Cerros Island.

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